INSULATION FACTS #67

NORTH AMERICAN INSULATION MANUFACTURERS ASSOCIATION

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Product Information from NAIMA:

Fibrous Glass Commercial Insulation Boards

In this issue, we address the specific uses, performance characteristics, fire safety, condensation control, personnel protection, and installation recommendations for fibrous glass commercial insulation boards.

Uses

Fibrous glass commercial insulation boards may be applied to the exterior of sheet metal ducts, housings, and plenums. These rigid to semi-rigid boards are also suitable for insulating chillers and other cold or hot equipment, and can be used in applications operating within the temperature range of 0°F (-18°C) to 450°F (232°C). They are available in thicknesses from 1" (25 mm) to 4" (102 mm) in ½" (13 mm) increments.

Description

These products are composed of glass fibers bonded together with a thermosetting resin. They are manufactured in various stiffnesses, from flexible to rigid. Fibrous glass commercial insulation boards are available unfaced, or faced with FSK (foil/scrim/kraft) or ASJ (all-service jacket) facings. Both are excellent vapor retarders; FSK provides a neat, metallic finish, while ASJ presents a white finish.

Features and Benefits

Versatility

Commercial insulation boards are available in a range of stiffnesses, from flexible to rigid, faced or unfaced, and in a range of thicknesses. They may be applied to round, rectangular, oval, or irregularly shaped ducts, plenums, and equipment.

Thermally efficient

These insulations reduce heat loss or gain through duct, plenum, and equipment walls, saving energy and helping to reduce equipment operating costs.

Mechanical strength

Higher density insulations resist compression. They are especially suited for use in mechanical rooms, where traffic is frequent and a neat finished appearance is desired.

Easy to install

Commercial insulation boards can be installed simply by impaling on weld pins and securing with speed clips or washers, or using special weld pins with integral cupped head washers. Panels are easy to handle, cut, and install.

Acoustical performance

These fibrous glass insulations provide excellent sound absorption properties for vibration damping but do not control airborne noise. Consult manufacturers' literature for specific sound absorption data.

Code compliance

Fibrous glass commercial insulation boards comply with widely used building codes including ICC, BOCA, CABO, ICBO, and SBCCI.

Thermal performance

Manufacturers' published literature show these products to perform in the R-value ranges shown in Table 1, depending on product type and density.

Fire Safety

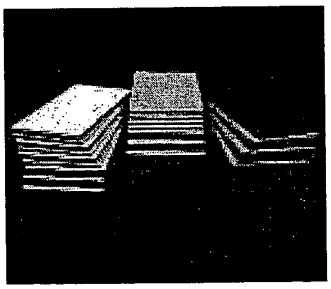
Fibrous glass commercial insulation boards meet NFPA 90A and 90B requirements, including limited combustibility, and comply with all widely used model codes including ICC, BOCA, CABO, ICBO, and SBCCI.

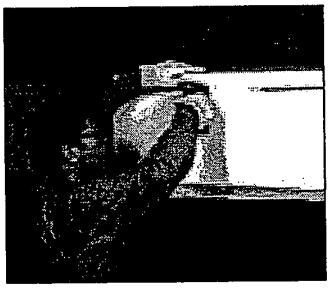
Table 1 – Commonly Available Insulation Board R-Values (ASTM C 518)

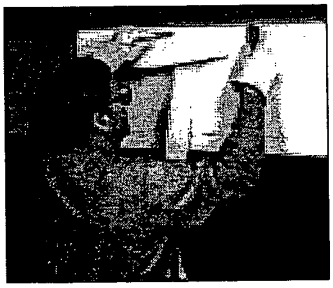
Manufacturers' published literature show these products to perform in the following R-value ranges, depending on product type and density.

Thickness, in (mm)	1 (25)	1½ (38)	2 (51)	2½ (64)	3 (76)	3½ (89)	4 (102)
R-value*, hr•ft²•°F/Btu	4.0–4.5	6.0–6.8	8.0–9.0	10.0–11.4	12.0–13.6	14.0–16.0	16.0–18.0
(RSI, m²•°C/W)	0.70–0.79	1.06–1.20	1.41–1.58	1.75–2.01	2.11–2.39	2.46–2.82	2.82–3.17

**R-values are for insulation only and do not include air films or reflective surfaces. Consult individual manufacturers for specific thermal performance data.*

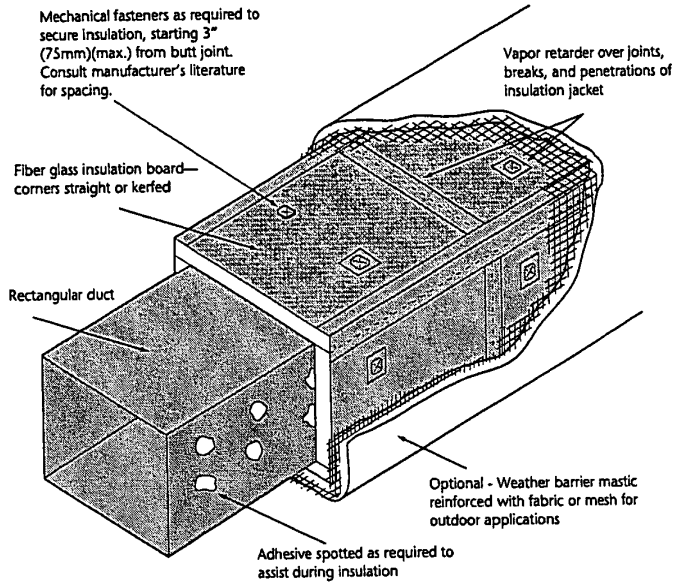






Commercial insulation boards are available unfaced, or with ASJ (all-service jacket) or FSK (foil/scrim/kraft) vapor retarder facings. Faced boards are easily installed by cutting to size and trimming to provide a staple flap. Where a vapor retarder is required, seams and joints are sealed with glass fabric and mastic or with pressure sensitive tape. Commercial boards may also be installed by impaling on weld pins and securing with clips or washers.

Figure 1 – Installation of fibrous glass insulation board on duct or plenum exterior.

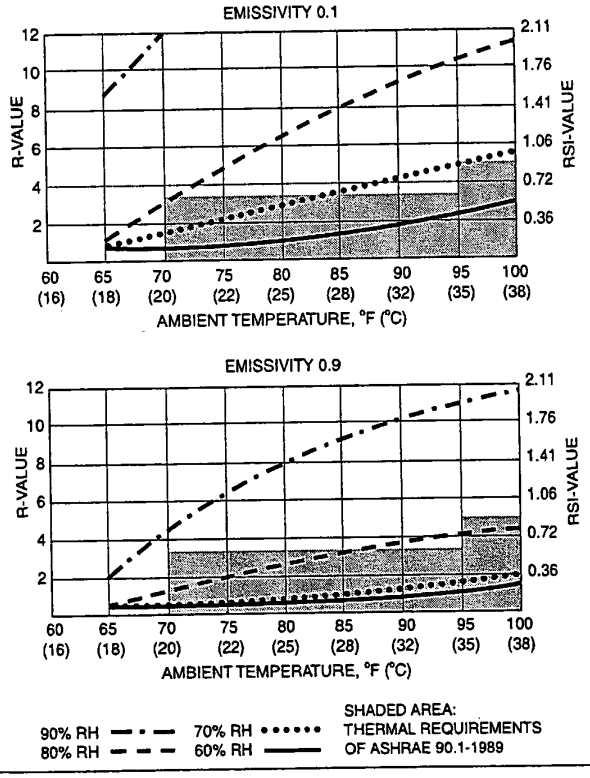


(From *National Commercial & Industrial Insulation Standards*, Midwest Insulation Contractors Association)

Installation

On exterior duct surfaces, insulation is installed by impaling it on weld pins and securing with speed clips or washers, or using special weld pins with integral cupped head washers. Unfaced boards can then be finished with reinforced insulating cement, canvas, or weatherproof mastic, depending upon the application. See Figure 1. Faced boards can be installed in the same way. Joints between boards are sealed with pressure-sensitive tape or glass fabric and mastic.

Figure 2 – Required R-Values to Prevent Moisture Condensation



Condensation Control

Figure 2 shows the installed R-values of fibrous glass commercial insulation boards required to prevent moisture condensation on the vapor retarder surface under varying conditions of ambient temperature and relative humidity. Curves are based on internal air temperatures of 55°F (13°C) and no air movement on the exterior surface.

Insulating for Personnel Protection

Insulation thickness is considered sufficient to provide personnel protection when its surface temperature installed on a hot surface does not exceed 140°F (60°C). Table 2, based on NAIMA 3E Plus®, *Thickness for Maximum Surface Temperature Program*, gives the thicknesses of fibrous glass insulation boards that will achieve such protection at operating temperatures to 450°F (232°C).

Table 2 – Thickness Required for Personnel Protection

System Operating Temperature	Insulation Thickness, in. (mm) Emittance: 0.1 (FSK)	Emittance: 0.9 (AS) or bare insulation)
150°F (66°C)	½ (13)	½ (13)
200°F (93°C)	½ (13)	½ (13)
250°F (121°C)	1 (25)	½ (13)
300°F (149°C)	1 (25)	½ (13)
350°F (177°C)	1½ (38)	1 (25)
400°F (204°C)	2 (51)	1 (25)
450°F (232°C)	2½ (64)	1 (25)

Conditions:
Vertical flat surface
Average ambient temperature 75°F (23°C)
No air movement on exterior surface

Short Form Field Inspection Check List	YES	NO
Were all joints in sheet metal ductwork tightly sealed before installing insulation?	☐	☐
Are mechanical fasteners the right length for the insulation thickness?	☐	☐
Are mechanical fasteners spaced at the correct intervals?	☐	☐
Where a vapor retarder is required, are seams of insulation boards tightly taped or sealed with glass fabric and mastic?	☐ ☐	☐ ☐
Is pressure-sensitive tape at least 3" (76mm) wide over all seams and joints?	☐	☐
Is field-jacketing material evenly and uniformly applied, with no gaps or seams?	☐	☐
Where a vapor retarder is required, are all fasteners tightly sealed with pressure-sensitive tape matching the insulation facing?	☐	☐

About NAIMA

NAIMA is the association for North American manufacturers of fiber glass, rock wool, and slag wool insulation products. Its role is to promote energy efficiency and environmental preservation through the use of fiber glass, rock wool, and slag wool insulation, and to encourage the safe production and use of these materials.

In May, 1999, NAIMA began implementing a comprehensive voluntary work practice partnership with the U. S. Occupational Safety and Health Administration (OSHA). The program, known as the Health and Safety Partnership Program, or HSPP, promotes the safe handling and use of insulation materials and incorporates education and training for the manufacture, fabrication, installation, and removal of fiber glass, rock wool, and slag wool insulation products.

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Website: http://www.naima.org

For additional information on fibrous glass commercial insulation boards, contact one of the manufacturers listed below.

CertainTeed Corp.
P. O. Box 860
Valley Forge, PA 19482
800-233-8990

Johns Manville Corp.
P. O. Box 5108
Denver, CO 80217
800-654-3103

Knauf Fiber Glass
One Knauf Drive
Shelbyville, IN 46176
800-825-4434

Owens Corning
One Owens Corning Parkway
Toledo, OH 43659
800-GET-PINK

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